robotics Swiss National Centre of Competence in Research

HRI pioneers workshop 2013, 6th March 2013, Tokyo, Japan

Motivating Children to Tidy up their Toys with a Robotic Box

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Idea: Motivate children to tidy up their room

- Make tidying up more pleasant and playful
- Interactive robotic box "Ranger" developed at EPFL
- Evaluate first remote controlled prototype in families

→ study adoption of domestic robots
→ explore niches for robotics in daily lives of humans

Method: Wizard-of-Oz experiments

- 14 families (31 children (2-10 years), 17 parents)
- 2 different robot behaviors (conditions):
  - ***active*** (system-driven)
  - ***passive*** (learner-driven)
- Measurements: empirical, behavioral, subjective data

Girl showing toy to Ranger (left). Boy putting his fire truck into Ranger (right).

Evaluation: Family's feedback

- Both children and parents like Ranger
- Appealing design (simple wood, colors, sounds, eyes)
- Wish of having several boxes and probably speech

Room before (left) and after (right) tidying up with Ranger.

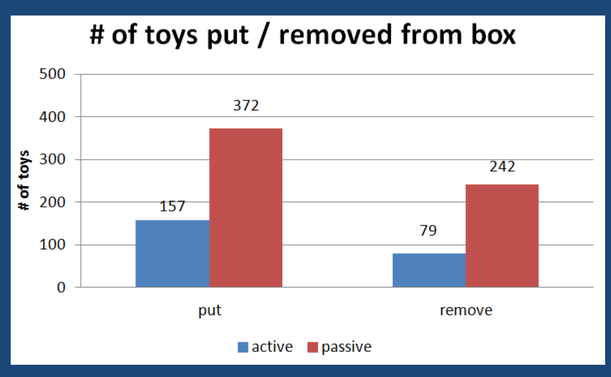
Photo below: Two boys with Ranger.

When toy is put / removed, Ranger shows colors and makes sounds. When putting several toys, Ranger dances and shows a lightshow.

In the "***active***" condition, the box moves around, looks for toys on the floor, whereas in the "***passive***" condition it hardly moves.

Results: Child-robot interaction

- 14 videos (~3 hours interaction)
  - Duration: 5-27 min, (M = 704 s, SD = 245 s)
  - Delay first object: 23 sec - 23 min, average 2:22 min
- 1740 activities: 47 % of the time children explore the box



More toys put / removed when box is ***passive*** compared to ***active.***
Comparing means ANOVA:
(F (1,29) = 4.18, p = .05) /
(F (1,29) = 3.48, p = .072)

- in active condition: more explore, misuse, touch, gestures
- children describe Ranger as "happy" / "unhappy"

Future Work

→ Controlled experiments to study which features of robot contribute to the overall effect
→ Long-term field study to investigate what happens beyond initial adoption

Conclusions

→ Robot's behavior impacts how children interact with it
  - An **interactive robot** is engaging but also distracts
  - A **passive robot** supports better a "task" like tidying

→ Robot's design could be personalized
  - Qualitative **gender and age** differences in interaction
  - Each child has **personal preferences**

→ Design needs to enable sustainable interaction
  - Strong **novelty effects** ask for "evolving robot"
  - Adapted to **family's needs**

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FNSNF Swiss National Science Foundation

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